17th Pacific Rim Real Estate Society Conference [Residential markets/Real Estate market analysis]

Malaysia High-Rise Residential Property Management: 2004-2010 Trends & Scenario

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Abstract;

Property management requires an understanding of infrastructure management, service life planning and quality management. Today, people are beginning to realize that effective property management in high-rise residential property can sustain the property value and maintaining high returns on their investment. The continuous growth of high-rise residential properties indicates that there is a need for an effective property management system to provide a sustainable high-rise residential property development. As intensive as these studies are, they do not attempt to investigate the correlation between property management systems with the trends of Malaysia high-rise residential property development. By examining the trends and scenario of Malaysia high-rise residential property development, this paper aims to gain an understanding of impacts from the effectiveness of property management in this scope area. Findings from this scoping paper will assist in providing a greater understanding and possible solutions for the current Malaysian property management systems for the expanding high-rise residential unit market. With current high rise units in excess of 1.3 million and increasing, the need for more cost effective management systems are of highly important to the Malaysian Property Industry.

Keywords: High-rise residential property, Property management, Property market trends.

Non-Refereed paper

Introduction

For years, the property management and construction industries have focused on three primary concerns in the creation of buildings. The first, of utmost significance to property managers, is the design of a building and the management after the development. Is the building enjoyable to view and occupy? Does the organization of spaces enhance the user's program? The second concern, the primary focus of contractors and developers, is the construction of a building. How will the building be built? How much will the building cost? The client expects a contractor to be able to construct a sound building for the predicted construction cost (Amaratunga et. al., 2002). These are typically the primary concerns of a client when the idea of developing a building is addressed, so it is no surprise that property managers, developers and contractors focus their efforts to this end. These are noteworthy concerns; however they are not the only concerns that should be addressed when planning for the future. A third concern that is receiving more attention, as building owners investigate the economics of property management, is the cost of building operations over the life of a building (Dunk, 2004). The combination of economic theory and computer technology allows for more sophisticated approach to the design and construction of materials component than ever before. Instead of merely looking at the materials component in terms of cost to design and build, owners can broaden their perspective to include operations costs, maintenance costs, repair costs, replacement costs, and disposal costs (Dunk, 2004).

The government of Malaysia recognises housing as a basic human need and an important component of the economy. The situations of providing the sustainable and affordable housing are part of their aim. This has led to the formulation of variety in policies and approaches aimed at ensuring that all Malaysian have access to adequate programmes (Alias, Foziah and Ho, 2006). The Malaysian government has also formulated a housing policy which aims to strengthen the involvement of private sector in housing production and delivery especially in housing schemes development (Aishah, 1999; Alias, 2007; Jamila, 1994). Theoretically, when we are talking about the housing supply and demand, the market forces should be operated to achieve an equilibrium between demand and supply of the products. However, in actual practice and fact, the housing market fails to provide balanced situation between housing demand and supply. There is argument that irresponsiveness of the housing development practice also contributes to the issues of oversupply (Bramley, 1995; Hull, 1997).

Currently, demand is always proportional to the increase in population. As population increasing, the number of demand on residential will increase as well. The process of developing and constructing this development cause a big amount of money. Fortunately, when they cannot handle the money efficiently, the issues such delayed, sick and abandon construction will come in to the picture (Einsiedel, 1997; Eddy, 2004).

Malaysia High Rise residential profile

In Malaysia, based on high-rise residential development, programmes are carried out by both the public and the private sector. The public sector concentrates mainly on public-housing (40 percent on public housing flat and apartment) programmes while the private sector apart from complying on the 30 percent low cost housing unit, concentrates on medium and high cost housing programmes (60 percent on apartment and condominium development) (9^{th} Malaysia Plan). Currently, living in a residential high-rise is now becoming a lifestyle or trend among the urban professional community in Malaysia. One of the reasons people prefer to stay in a high-rise residential is the facilities provided within the housing area.

High-rise residential is a unique property and it differs from landed property, such as bungalows and terrace houses. Its uniqueness presents itself during the management era after the properties have been occupied, where facilities management becomes an issue (Linariza and Ashok 2003). Most probably, facilities provided at the high-rise residential building is more complete and

more stylish compared to the low-rise residential building (Bramley, Bartlett, and Lambert, 1995; Chan, 1997). Besides that, the high-rise residential buildings always being developed near the city and giving easier accessment to the public utilities and work.

Unfortunately most of the high-rise residential buildings found were not effectively managed, thus ignoring the sustainable agenda in housing management. Residents complained through the mass media and the issues were always about incompetent facility management such dysfunctional lifts, rubbish not collected according to schedule, vandalism, misused of sinking funds; as well as disputes among resident (Liias, 1998). In short, all the issues raised were centred on the 3 aspects in providing effective facility managements, namely financial, maintenance and people.

Financial Assistance

Many issues have been discussed not just in this paper, but also due to the world environment of property managers, facility managers, developers and surveyors. The financial construct has 3 dimensions namely financial resources, financial allocation and financial expenses (Pearce, 1992). Researcher just picked up some of them as the issues to discuss in this paper. On top of this, the financial aspect needed to be planned via allocation and monitoring of its expenses. As an example, allocation for cosmetic recovery should be the last agenda in housing maintenance activity (Nicol, 2002; Amarilla *et al*., 2002).

Further discussion and review of the cost management from property managers and real estate personal perspective are very much important. A bit late for them to involve in this matter, but they still have time to improve their knowledge and understanding in practising this approach for the cost efficiencies sake.

Demand & Supply

The demand on the high-rise residential building always increases every year. The situation happens because the land area for the usage has become less and less every single day. These conditions occur because there are construction and housing development which requires more land area and space. Currently, the Property Market report published by National Property Information Centre (NAPIC) 2010 showing that, high-rise building led the housing development especially in the state with City status. Table 1 shows the results of the development from year 2004 to 2010.

Table 1: Incoming Supply for High-rise Residential Property development 2004-2010.

HIGH-RISE RESIDENTIAL PROPERTY DEVELOPMENT (DD-incoming)							
States	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010***
WP Kuala Lumpur	68,021	53,079	44,990	35,089	33,127	26,825	26,210
WP Putrajaya	512	226	226	226	226	226	226
WP Labuan	0	0	66	0	400	400	400
Selangor	115,842	108,728	107,866	81,356	64,680	60,025	59,423
Johor	26,299	30,005	22,284	31,317	27,189	25,970	25,823
Pulau Pinang	30,875	31,579	36,423	27,078	23,104	18,616	17,314
Negeri Sembilan	15,824	13,234	10,281	1,853	2,283	2,191	2,095
Perak	1,540	2,963	5,870	10,706	10,239	10,371	10,403
Melaka	3,266	3,903	3,773	3,798	3,278	3,278	3,278
Kedah	1,938	2,800	4,489	2,944	2,946	2,857	2,857
Pahang	5,400	5,096	2,265	4,530	4,940	4,989	4,989
Terengganu	324	272	3,169	395	697	601	601
Kelantan	1,232	1,217	139	919	919	919	919
Perlis	1,361	1,361	1,617	517	37	37	37
Sabah	7,972	11,771	10,548	16,324	15,702	18,743	18,815
Sarawak	3,258	3,358	4,663	3,406	3,560	1,953	2,203
	283,664	**269,592**	**258,669**	**220,458**	**193,327**	**178,001**	**175,593**
**up to 2nd Quarter of the year*							

Source: Property Market Report (NAPIC), 2010

In implementing the activities of forecasting the market supply, formulating the housing development process, allocating the future housing development plan, it becomes a nature of the planning system to fulfil the objective of meeting housing needs (Ratcliffe, 1981; Nicol, 2002; Golland and Gillen, 2004). In order to ensure the local housing development is properly catered, Golland and Gillen, 2004 stressed that the housing planning process should recognise that housing needs are not only driven by population trends, but also by the affordability of the population and the cost of the housing development.

Land use profile

Subscribe to the situation on demand and supply, the financial management should be focused deeply and the best cost management approach must be appointed seriously. Built-up areas are defined in the National Physical Plan, 2005 as areas under predominantly urban use but comprising a variety of land uses such as residential, commercial, industrial and institutional uses together with supporting facilities such as roads, public utilities, open spaces, parks and vacant lands. Table 2 show the significant of land area which has been used to the different purpose for Malaysia Peninsular.

Table 2: Land Area Used for Malaysia Peninsular.

State / Region	Land Area (ha.)								
	Built Up	%	Agriculture	%	Forest	%	Water Bodies	%	Total
Perlis	8,980	11.0	61,359	75.4	10,169	12.5	921	1.1	81,429
%	2.1		0.9		0.2		0.4		0.6
Kedah	34,006	3.6	565,929	59.8	340,655	36.0	6,160	0.7	946,752
%	7.8		8.5		5.8		2.7		7.2
Pulau Pinang	29,565	2.3	45,289	43.4	24,383	23.4	5,118	4.9	104,355
%	6.8		0.7		0.4		2.2		0.8
Perak	42,954	2.0	939,797	44.8	1,004,716	47.9	109,121	5.2	2,096,588
%	9.8		14.1		17.2		47.3		15.9
Northern Region	**115,507**	**3.6**	**1,612,374**	**49.9**	**1,379,929**	**42.7**	**121,320**	**3.8**	**3,229,124**
%	**26.4**		**24.2**		**23.6**		**52.5**		**24.5**
Selangor	131,106	16.5	390,179	49.0	257,588	32.4	16,908	2.1	795,781
%	30.0		5.9		4.4		7.3		6.0
WP Kuala Lumpur	18,158	63.5	9,484	34.4	219	0.8	366	1.3	28,591
%	4.2		0.1		0.0		0.2		0.2
Negeri Sembilan	29,724	4.5	448,757	67.5	183,461	27.6	3,372	0.5	665,314
%	6.8		6.7		3.1		1.5		5.0
Melaka	17,261	10.4	139,194	84.1	8,596	5.2	364	0.2	165,415
%	3.9		2.1		0.1		0.2		1.3
Central Region	**196,249**	**11.9**	**987,978**	**59.7**	**449,864**	**27.2**	**21,010**	**1.3**	**1,655,101**
%	**44.9**		**14.8**		**7.7**		**9.1**		**12.6**
Johor	65,379	3.4	1,378,695	72.3	438,383	23.0	24,933	1.3	1,907,693
%	15.0		20.7		7.5		10.8		14.5
Southern Region	**65,379**	**3.4**	**1,378,695**	**72.3**	**438,686**	**23.0**	**24,933**	**1.3**	**1,907,693**
%	**15.0**		**20.7**		**7.5**		**10.8**		**14.5**
Pahang	27,382	0.8	1,471,212	41.0	2,075,952	57.8	17,758	0.5	3,592,304
%	6.3		22.1		35.5		7.7		27.3
Terengganu	23,669	1.8	564,121	43.6	665,895	51.4	41,132	3.2	1,294,817
%	5.4		8.5		11.4		17.8		9.8
Kelantan	8,906	0.6	654,346	43.5	834,567	55.5	4,782	0.3	1,502,601
%	2.0		9.8		14.3		2.1		11.4
Eastern Region	**59,957**	**0.9**	**2,689,679**	**42.1**	**3,576,414**	**56.0**	**63,672**	**1.0**	**6,389,722**
%	**13.7**		**40.3**		**61.2**		**27.6**		**48.5**
Peninsular Malaysia	**437,092**	**3.3**	**6,668,726**	**50.6**	**5,844,887**	**44.4**	**230,935**	**1.7**	**1,318,164**
%	**100.0**		**100.0**		**100.0**		**100.0**		**100.0**

Source: National Physical Plan (NPP), 2005

Cost Related

Recognises with the scenario, the current trend shows that the construction cost has been considered and discussed hardly almost every year. The number slightly increasing and has been confirmed from Malaysia Plan for the year 1996 to 2015 in table 3. Based on National Physical plan, 2005, issues on considering the cost and capacity of upgrading the housing development is a must.

Table 3: Cost involved in Malaysia Plan 1996 to 2015.

Industry (in RM Million)	Seventh Malaysia Plan [1996-1999]	Eighth Malaysia Plan [2000-2005]	Nineth Malaysia Plan [2006-2010]	Tenth Malaysia Plan* [2011-2015]	Total
Economic	**47,172**	**50,515**	**117,300**	**126,500**	**400,127**
Social	**31,284**	**37,518**	**78,200**	**69,000**	**248,294**
Security	11,644	10,750	23,000	23,000	89,402
General Administration	8,937	11,217	11,500	11,500	47,539
Total	**99,037**	**110,000**	**230,000**	**230,000**	

**as May 2010*

Source: CIDB, 2010; Government of Malaysia (Eight Malaysia Plan-Tenth Malaysia Plan), 2010

Table 4 shows the evidence that housing development environment in Malaysia needs the best approach, especially in relation to financial and cost management. Adapted to this condition, ideas and reviews from property managers or real estate person are important to guarantee of better financial management in the future.

Table 4: Statistics Of Troubled Housing Projects (Delayed, Sick And Abandoned) By State Until December 31, 2009

State	Delayed Project			Sick			Abandoned			**Total**		
	P	H	B	P	H	B	P	H	B	**P**	**H**	**B**
Selangor	**27**	**4,540**	**2,377**	**96**	**25,492**	**18,978**	**40**	**20,528**	**14,762**	**165**	**50,558**	**36,117**
Pulau Pinang	**3**	**468**	**184**	**19**	**4,925**	**3,587**	**12**	**7,253**	**5,112**	**34**	**12,646**	**8,883**
Johor	**2**	**32**	**14**	**26**	**5,621**	**4,361**	**33**	**8,196**	**3,876**	**61**	**13,849**	**8,251**
Perak	6	456	140	35	7,289	3,754	6	972	578	**47**	**8,717**	**4,472**
Negeri Sembilan	1	12	12	11	1,532	1,044	20	4,653	2,411	**32**	**6,197**	**3,467**
WP Kuala Lumpur	10	1,425	919	10	2,126	1,542	6	2,408	1,365	**26**	**5,959**	**3,826**
Melaka	6	288	132	12	4,279	3,106	7	975	570	**25**	**5,542**	**3,808**
Kedah	3	310	140	20	3,222	1,779	9	1,374	713	**32**	**4,906**	**2,632**
Pahang	2	368	145	12	1,386	819	11	3,016	2,050	**25**	**4,770**	**3,014**
Kelantan	0	0	0	19	1,037	820	3	519	367	**22**	**1,556**	**1,187**
Terengganu	3	91	48	16	877	845	1	21	20	**20**	**989**	**914**
Perlis	0	0	0	3	99	50	0	0	0	**3**	**99**	**50**
Total	**63**	**7,990**	**4,111**	**281**	**57,885**	**40,686**	**148**	**49,913**	**31,824**	**492**	**115,788**	**76,621**

**P=Project; H=Housing; B=Buyer*

Source: Ministry of Housing and Local Authority, 2010

Malaysia has achieved a measure of success in its efforts to provide shelter for all in a sustainable urban environment. This was made possible by the joint efforts of all concerned – government, local authorities, financial institutions, the private sector and the target group themselves. By referring to Malaysia Plan (five yearly programmes beginning with the First Malaysia Plan 1966-1970), both the public and private sectors intensify their efforts in the implementation of the residential development to meet increasing demand (Ho, 1994; and Tapsir, 2001). In this regard, Malaysia has made a firm and clear commitment to build needed infrastructure, both social and physical infrastructure. According to the current situation, CIDB Malaysia (2010b) clearly stated their focus in reviewing the potential facilitation of a Construction Recycling Infrastructure and has initiated programmes on the use of sciences such as Value Management and Whole Life Cycle Costing.

As a developing country, an increase in job opportunities in urban areas has resulted in an increase of demand for housing in three major cities in Malaysia, which are Kuala Lumpur, Penang and Johor Bahru. Housing, education and other social services continued to be the priority of

Malaysia's development programmes aimed at quality living for various types of income groups. Given the fact that the cost of building infrastructure is very high and many Malaysians cannot possibly build all the infrastructures by themselves, reliable government subsidy is required, this reiterates the importance of establishing an infrastructure development including housing of which Malaysia had provided the adequate funds to finance and realize these social policies (Government of Malaysia, 2010).

Conclusion

As already shown, buildings are a prime example of high cost purchases, yet consideration of long term costs is not given the attention it deserves. The past decade have seen many attempts to encourage a holistic approach to what is in effect the 'life span' on their cost analysis such as Activity Based Costing and Total Cost Management, but with limited success, especially in Malaysia. Thus, the major problem of Malaysia residential property development is that it has too many residential property constructions to be completed, while the associated costs are still increasing.

The government of Malaysia recognises housing as a basic human necessity and an important component of the urban economy. This has led to the formulation of policies and programmes aimed at ensuring that all Malaysians have access to adequate shelter and related activities. The situation that happen in Malaysia residential property development always led to the sensitivity of budget allocation in their national plan.

Future Research Progress

As this research is based on data collected from relevant documents at the moment, further investigation needs to be conducted to find out the validity and ability of this framework to the housing development in Malaysia. This scope may be related to further financial background investigation, site management and effectiveness of the practice which are found to be other important factors in studies conducted by many researchers in both developing as well developed countries.

Reference

[1] Alias Rameli (2007). *Application of Method of Content Analysis and Perception Survey in Evaluating the Effectiveness of Planning System in Managing Housing Supply*. Proceedings of the 2nd. Post Graduate Seminar on Research of Built Environment 2007. March 6. Faculty of Built Environment, Universiti Teknologi Malaysia.

[2] Alias Rameli, Foziah Johar and Ho, C.S (2006). *The Management of Housing Supply in Malaysia: Incorporating Market Mechanisms in Housing Planning Process*. Proceedings of the International Conference on Construction Industry 2006. June 22-23. Universitas Bung Hatta,Indonesia.

[3] Alinah, A. (2004). *Taklimat Penubuhan PraPerbadanan Pengurusan*. LPH Selangor.

[4] Amadi-Echendu, J.E., (2004). *The paradigm shift from maintenance to physical asset management*. IEEE Transactions on Engineering Management (in press).

[5] Amaratunga, D., Sharshar, M., and Baldry, D., (2002). Assessment of facilities management performance – what next? *Journal of Facilities*, 18(1/2), pp.66-67.

[6] Amarilla, B.; Dunowicz, R.; Hasse, R. (2002). *Social Housing Maintenance.* Proceedings of The XXX IAHS World Congress on Housing. 9-13 September 2002. Edited By: Oktay Ural, Vitor Abrantes, Antonio Tadeu. Portugal: Pedro Batista – Artes Graficas, Lda. pp. 1951-1957.

[7] Asiah Othman (1999). *The Effect Of The Planning System On Housing Development : A Study Of The Development : A Study Of Developers Behaviour In Kuala Lumpur and Johor Bahru, Malaysia*. University of Aberdeen : Ph.D. Thesis.

[8] Bramley, G. (2003). *Planning Regulation and Housing Supply In a Market System*. In : O'Sullivan, T. and Gibb, K. eds. Housing Economics and Public Policy. United Kingdom : Blackwell Science Ltd.

[9] Bramley, G., Bartlett, W. and Lambert, C. (1995). *Planning, The Market and Private House building*. London : UCL Press Ltd.

[10] Chan, K.T. (1997). Housing Delivery System. Proceeding of The National Housing Convention. Kuala Lumpur : 26-27 May, 1997. ISIS Malaysia.

[11] Construction Industry Development Board Malaysia, (2010). *Construction Economics.* Kuala Lumpur: CIDB Malaysia.

[12] Construction Industry Development Board, (2010). *Construction Industry Master Plan 2006-2015.* Kuala Lumpur: Construction Industry Development Board.

[13] DBKL (1999). *Hak Milik Strata & Perbadanan Pengurusan.* JPPH; JPP, Kuala Lumpur City Council (DBKL).

[14] DTI (Bourke, K. et al), (2005). *Achieving Whole Life Value in infrastructure and buildings*. United Kingdom: BRE Bookshop.

[15] Dunk, A.S., (2004). Product life cycle cost analysis: the impact of customer profiling, competitive advantage, and quality of IS information. *Management Accounting Research*, 15 (4), pp.401-414.

[16] Eddy, C. L. L. (2004). *Affordable Housing Development: Coming Together For The Benefit of The Nation*. The National Housing & Property Summit. 12-13 August 2004. Kuala Lumpur.

[17] Einsiedel, V. (1997). *Towards A Sustainable Housing Strategy*. Proceeding of The National Housing Convention. Kuala Lumpur: 26-27 May, 1997. ISIS Malaysia.

[18] *Energy Efficiency Best Practice Programme, provides impartial, authoritative information on energy efficiency techniques and technologies in industry and buildings* (www.carbontrust.co.uk/energy)

[19] Golland, A & Gillen, M (2004). *Housing need, housing demand and housing supply*. In: Golland, A and Blake, R, eds. Housing development: Theory, process and practice. London : Routledge. 45 – 70.

[20] Golland, A.(1998). *System of Housing Supply and Housing Production in Europe*: *A Comparison of the United Kingdom, the Netherlands and Germany*. England: Ashgate.

[21] *Government of Malaysia, Fourth Malaysia Plan 1981-1985 -Fifth Malaysia Plan 1986-1990 - Sixth Malaysia Plan 1991-1995-Seventh Malaysia Plan 1996-2000-Eight Malaysia Plan 2001-2005-Ninth Malaysia Plan 2006-2010-Tenth Malaysia Plan 20011-2015*. Jabatan Percetakan Negara. Kuala Lumpur.

[22] *HM Treasury Report*, Mott MacDonald, (2002).

[23] Ho, C. S., (1994). *Evaluation of Housing Estate Development In Relation To Housing Supply in Malaysia (With Reference To Urban Management and Housing Approval System*. University of Tokyo, Japan: Ph.D. Thesis.

[24] Hull, A (1997). Restructuring The Debate on Allocating Land for Housing Growth. Housing Studies : July 1997, Vol. 12 Issue 3. Great Britain : 367 – 382.

[25] *International Organisation for Standardisation (ISO), 2006. ISO 15686-5: Building and Constructed Assets – Service Life Planning: Part 5 - Whole-Life Costing (Draft).* Geneva: ISO.

[26] Jabatan Penilaian dan Perkhidmatan Harta (2000 - 2006). *Property Report, 1999 - 2005*. Kuala Lumpur : Percetakan Nasional Malaysia Berhad.

[27] Jamila, H. (1994). *Strata Title In Malaysia*. *Selangor*: Pelanduk Publications (M) Sdn. Bhd.

[28] Kirkham, R. J. and Boussabaine, R. J., (2005). *Whole Life-cycle Costing: Risk and Risk Responses*, Blackwell Publishing, Oxford, UK.

[29] Kirkham, R. J., Alisa, M., Da Silva, A. P., Grindley, T. and Brondsted, J., (2004). *Eurolifeform: An Integrated Probabilistic Whole Life Cycle Cost and Performance Model for Buildings and Civil Infrastructure*. Proceedings of the RICS Construction and Building Research Conference (COBRA 2004), Leeds Metropolitan University, 7-8 September 2004. (CD-ROM proceedings).

[30] Liias, R. (1998). Housing Stock: The Facilities For Future Development. *Journal of Facilities*. Volume 16 Number 11. pp. 288-294. MCB University Press.

[31] Linariza, H.; Ashok, V. (2003). Facility Management: An Introduction. *Journal of The Malaysian Surveyor*. 1st Quarter 2003 (38.1). pp. 13-19.

[32] Malaysia (2000). *National Land Code, 1965 (Act 56).* The Commissioner of Law Revision, Malaysia.

[33] Malaysia (2005). *National Physical Plan*. Kuala Lumpur: Federal Department of Town and Country Planning.

[34] Malaysia (2005). *Town and Country Planning Act, 1976 (Act 172).* The Commissioner of Law Revision, Malaysia.

[35] Malaysia Government (1999). *Housing In The New Millenium – Malaysian Perspective.* http://www.kpkt.gov.my/jabatan/jpn/artikel3.htm [Dilawati: 7 Sept 2004]. Updates: July 2003.

[36] Malaysia Government (2003d). *Panduan Kehidupan Bersama Dalam Bangunan Bertingkat (Pra-Strata). Jilid 1.* Jabatan Ketua Pengarah Tanah & Galian, Kementerian Sumber Asli & Alam Sekitar.

[37] Nicol, C. (2002). The Formulation of Local Housing Strategies : A Critical Evaluation. England : Ashgate.

[38] Pearce, B.J. (1992). The Effectiveness of the British Land Use Planning System. Journal TPR. Volume 63.

[39] Pelzeter, A., (2006). Lebenszykluskosten von Immobilien – Einfluss von Lage, Gestaltung und Umwelt, Müller, Köln, (Translation: English): *Life cycle cost of real estate - the influence of location, design and environment*, Müller, Köln.

[40] Ratcliffe, J., Stubbs, M. and Shepherd, M. (2004). Urban Planning and Real Estate Development (Second Edition). London : Spon Press.

[41] *RICS Surveyors' Construction Handbook Part 2: Section 2 Life Cycle Costing* (www.rics.org/RICSservices/BCIS/)

[42] Senthil, D. K., Ong, S. K., Reginald Tan B. H., Nee, A.Y.C., (2001). Environmental life cycle cost analysis of products. *Environmental Management and Health*, 12(3), pp.260-276.

[43] Sterman, J. D., (2000). *Business Dynamics: Systems Thinking and Modeling for a Complex World*. Boston, Irwin: McGraw-Hill.

[44] Tapsir, S.H. et. al., (2001). *Life Cycle Costing for Affordable Housing.* Conference on Construction Technology (CONTECT 2001), Sabah-Malaysia, 1-8, 2001.

[45] Tapsir, S.H., (2001). Final Report: *Affordable Housing Research Project – Life Cycle Costing Approach for Residential Housing in Malaysia Phase-1.* Ministry of Housing and Local Government, Malaysia, pp.65-72, 2001.

[46] Tapsir, Siti Hamisah and Usman, Fathoni, (2005). *Service Life Planning for affordable housing design: a challenge to Malaysia Construction Industry.* Not specified. pp. 1-9.

[47] Teo, K. S. (terjemahan) (1993). *Hak Milik Strata Di Malaysia.* Kuala Lumpur: Dewan Bahasa & Pustaka.

[48] Thompson, P. (1994). The Maintenance Factor In Facilities Management. *Journal of Facilities*. Volume 12 Number 6. pp. 13-16. MCB University Press.

[49] Tiun, L. T. (2006). *Managing High-Rise Residential Building In Malaysia: Where Are We?.*

[50] Yin, R. K., (2003). *Case Study Research: Design and Methods*. London: Sage Publications Inc.